

## April 1, 2018 Water Supply Forecast Discussion

The [Colorado Basin River Forecast Center \(CBRFC\)](#) geographic forecast area includes the Upper Colorado River Basin, Lower Colorado River Basin, and Eastern Great Basin.

### Water Supply Forecast Summary:

The greatest precipitation impacts during March 2018 were over the northwestern third of the CBRFC forecast area. This included the northern Great Basin of Utah and Idaho, the Green River Basin in Wyoming, and the Duchesne River Basin in northeast Utah. Precipitation amounts in these areas were generally near or above average for the month of March. Precipitation amounts dropped off dramatically south and east of these areas. The lowest March precipitation amounts with respect to average occurred in parts of the Dolores and San Juan River Basins and throughout the Lower Colorado River Basin of Arizona and New Mexico.

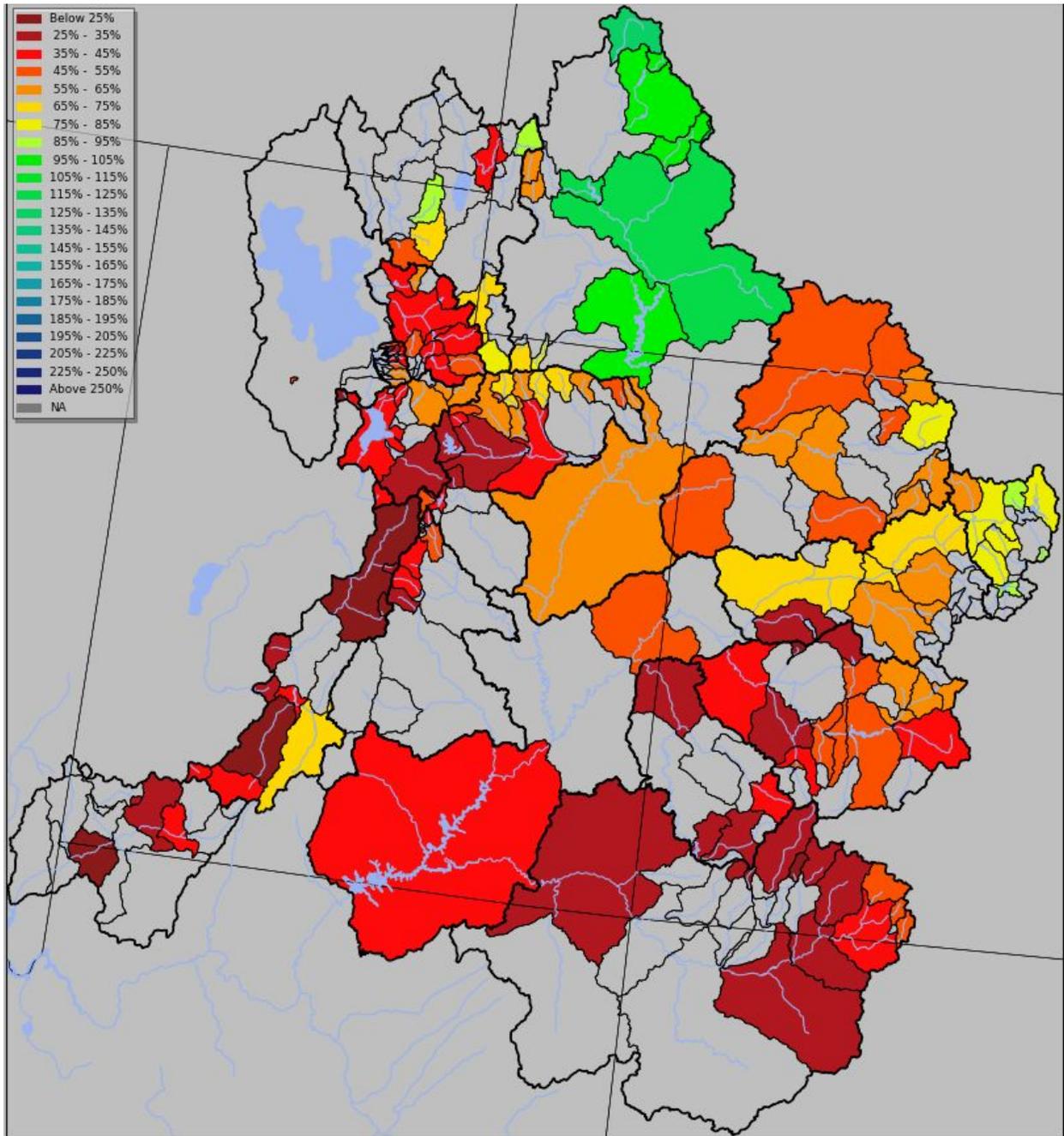
In these drier areas, water supply forecasts decreased from those issued in early March. The most significant decreases with respect to the April-July average occurred in the Dolores and San Juan River Basins. Meanwhile forecasts increased throughout the majority of the Duchesne River Basin and upper Green River Basin of Wyoming. Things were a little more hit and miss throughout the Great Basin with some areas favored more by the storm pattern than others. Rain also occurred at low and mid elevations and offered little improvement to the snowpack. Therefore increases in water supply forecasts were limited to a few higher elevation basins with little change or minor decreases elsewhere.

As of April 1st, above average April-July streamflow volume forecasts are limited to parts of the Green River Basin in Wyoming. Below average runoff is anticipated in all other areas. The lowest forecasts with respect to average exist in the San Juan, Dolores, and parts of the Gunnison River Basins. Low forecasts also extend from the Virgin River Basin of southwest Utah into parts of the Sevier River Basin and tributaries of the Green River in central Utah.

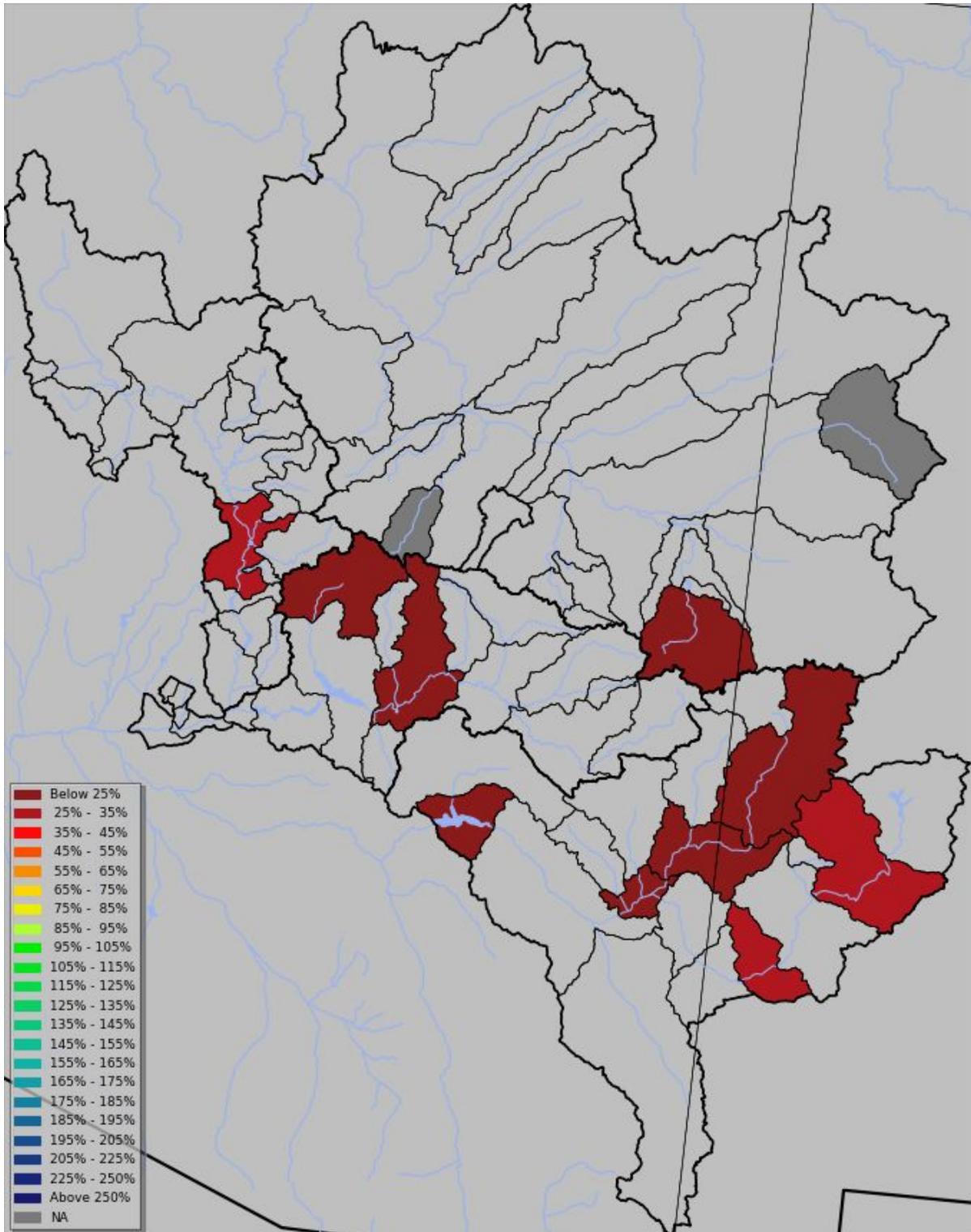
In the Lower Colorado River Basin of Arizona and New Mexico dry conditions extend back to the middle of last summer. Only the Gila River Basin received favorable precipitation in February of this year. April-May streamflow volumes are forecast to range from near 5 to 40 percent of median.

April-July unregulated inflow forecasts for some of the major reservoirs in the Upper Colorado River Basin include Fontenelle Reservoir 900 KAF (124% of average), Flaming Gorge 1000 KAF (102% of average), Blue Mesa Reservoir 345 KAF (51% of average), McPhee Reservoir 89 KAF (30% of average), and Navajo Reservoir 235 KAF (32% of average). The Lake Powell inflow forecast is 3.10 MAF or 43% of average.

Seasonal Water Supply Forecasts:



Upper Colorado, Great, Virgin River Basins: 2018 April-July forecast volumes as a percent of 1981-2010 average (50% exceedance probability forecast)



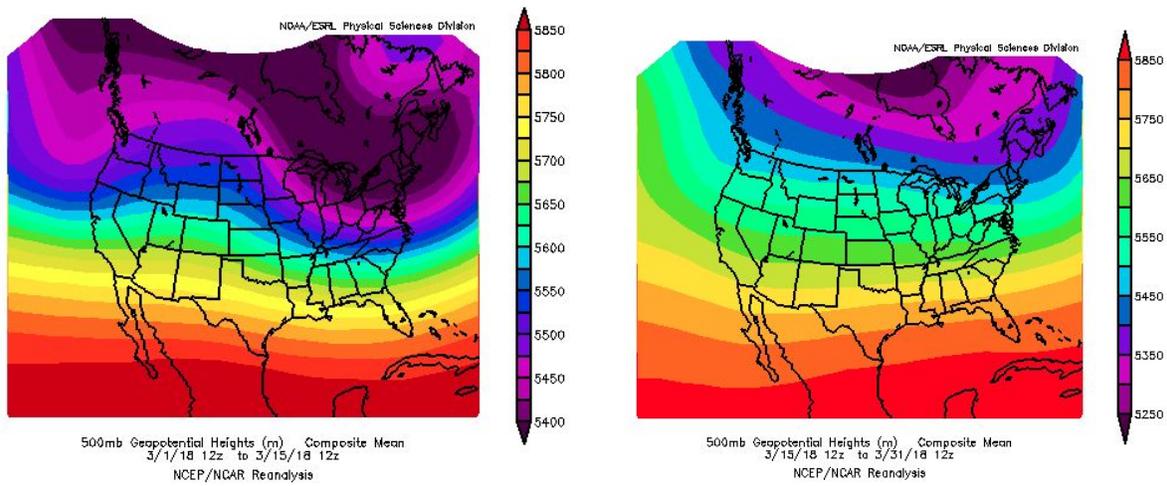
Lower Colorado Basin (AZ/NM): 2018 April-May forecast volumes as a percent of 1981-2010 median  
(50% exceedance probability forecast)

For specific site water supply forecasts click [here](#)

## Water Supply Discussion

### Weather Synopsis:

A high pressure ridge was the dominant weather feature the first couple weeks of March. Below average precipitation and above average temperatures were the result. This pattern gave way to a more zonal pattern for the second half of the month. The result was an increase in storm frequency; however the greatest impacts occurred over the northern part of the CBRFC forecast area.

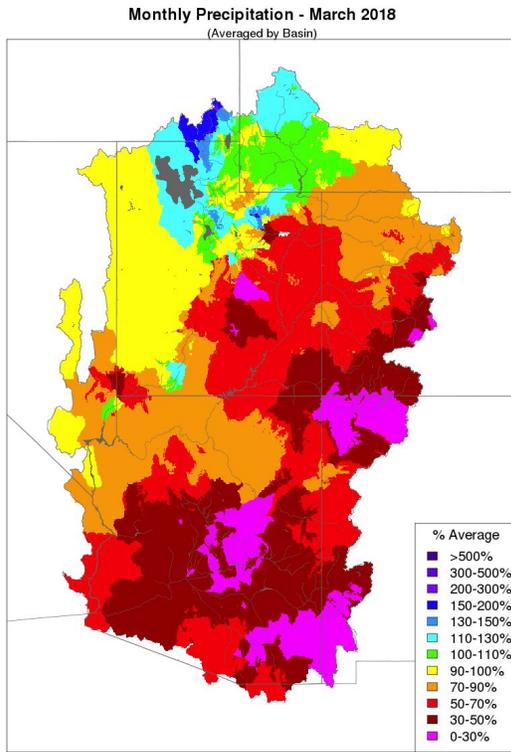


The mean atmospheric pattern during the month of March. The image on the left shows ridging the first half of March. This resulted in below average precipitation and generally above average temperatures. The image on the right shows a more zonal flow over the area the second half of March. An increase in storms occurred but most of the beneficial precipitation impacts were limited to northern areas.

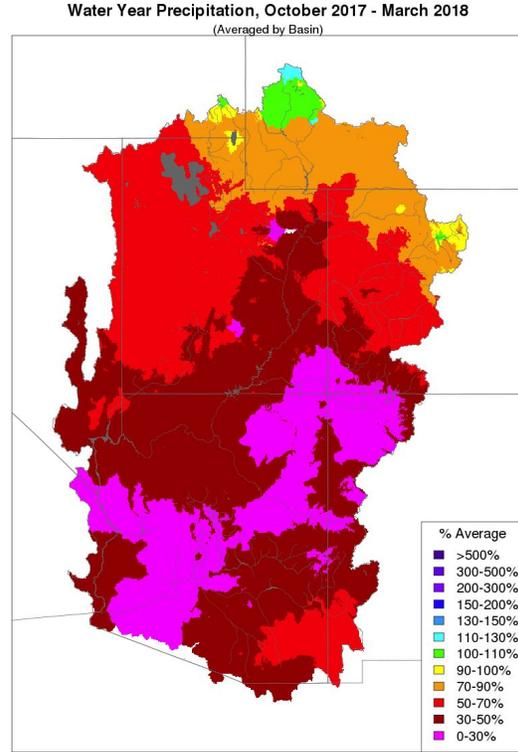
### Precipitation and Temperature:

Near to above average March precipitation occurred over the northwest portion of the CBRFC forecast area, covering most of the Great Basin as well as the Green River Basin of Wyoming and the Duchesne River Basin. Remaining areas generally received below average precipitation during March with southwest Colorado, New Mexico and Arizona basins receiving 50 percent of average or less during the month.

The water year (October-March) precipitation image below continues to show near or above average precipitation limited to the Green River Basin headwaters in Wyoming, the extreme eastern headwaters of the Colorado River mainstem, and the far northern Bear River Basin in southern Idaho. Elsewhere water year conditions are generally 70 percent of average or less. Several sites in the San Juan, Dolores, and Gunnison River Basins as well as sites in central and southeast Utah have water year (October-March) precipitation amounts that rank as the lowest on record.



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)



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Images: March 2018 and water year (Oct 2017-Mar 2018) precipitation graphics  
(Averaged by basins defined in the CBRFC hydrologic model)

Maximum temperatures averaged over the month were near normal over most of the area, with much of Utah actually slightly below normal.

Maximum and minimum monthly temperature deviation from average are displayed in the images below.

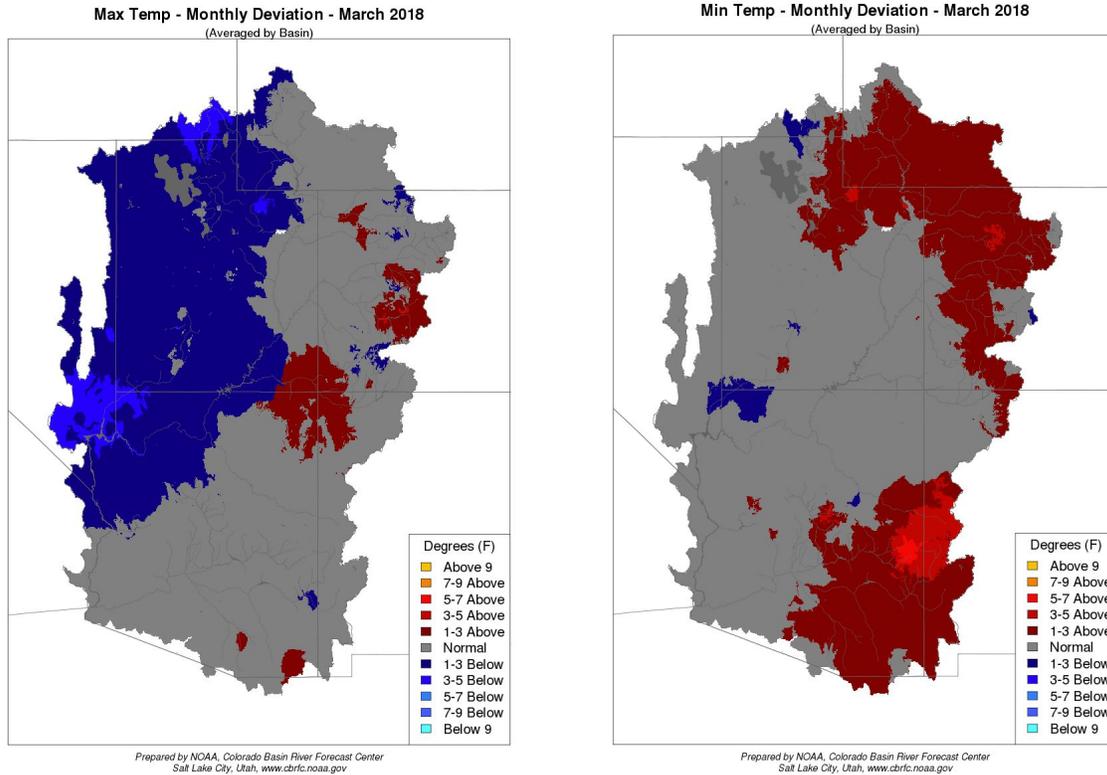


Image: Monthly maximum and minimum temperature departure from average for March 2018.  
(Averaged by basins defined in the CBRFC hydrologic model)

### Snowpack:

Very poor snowpack conditions exist throughout much of the Upper Colorado River Basin and Great Basin as of early April. The only basin with near to above average snow conditions is the Green River Basin in Wyoming which is near 110 percent of median. While there are a handful of individual SNOTEL sites with near normal snowpack in the headwaters of the Colorado River above Kremmling and the Bear River Basin in southern Idaho, both of those basins are near 80 percent of median overall. Snowpack in the rest of the river basins in the CBRFC forecast area is at 70 percent of median or less, with most of those between 50 and 60 percent of median.

Storms during the second half of March did slightly increase overall basin snowpack conditions as a percent of median from March 1st to April 1st across Utah, including the Great Basin as well as the Duchesne, Sevier, and Virgin river basins. However, water year precipitation is still much below average in these areas and snowpack conditions are still very poor so the end result was generally to keep forecasts from dropping further than they did.

Western Colorado had below normal precipitation during March, especially in the southern half, but near normal temperatures during the month helped these areas to hold onto the snow they had so that decreases in overall basin snowpack conditions as a percent of median from March 1st to April 1st were small.

The SNOTEL map image below indicates widespread poor snowpack conditions across the CBRFC forecast area. Sites depicted with a pink box have a snowpack below 30 percent of median at this time, while sites with a dark red box are below 50 percent of median.

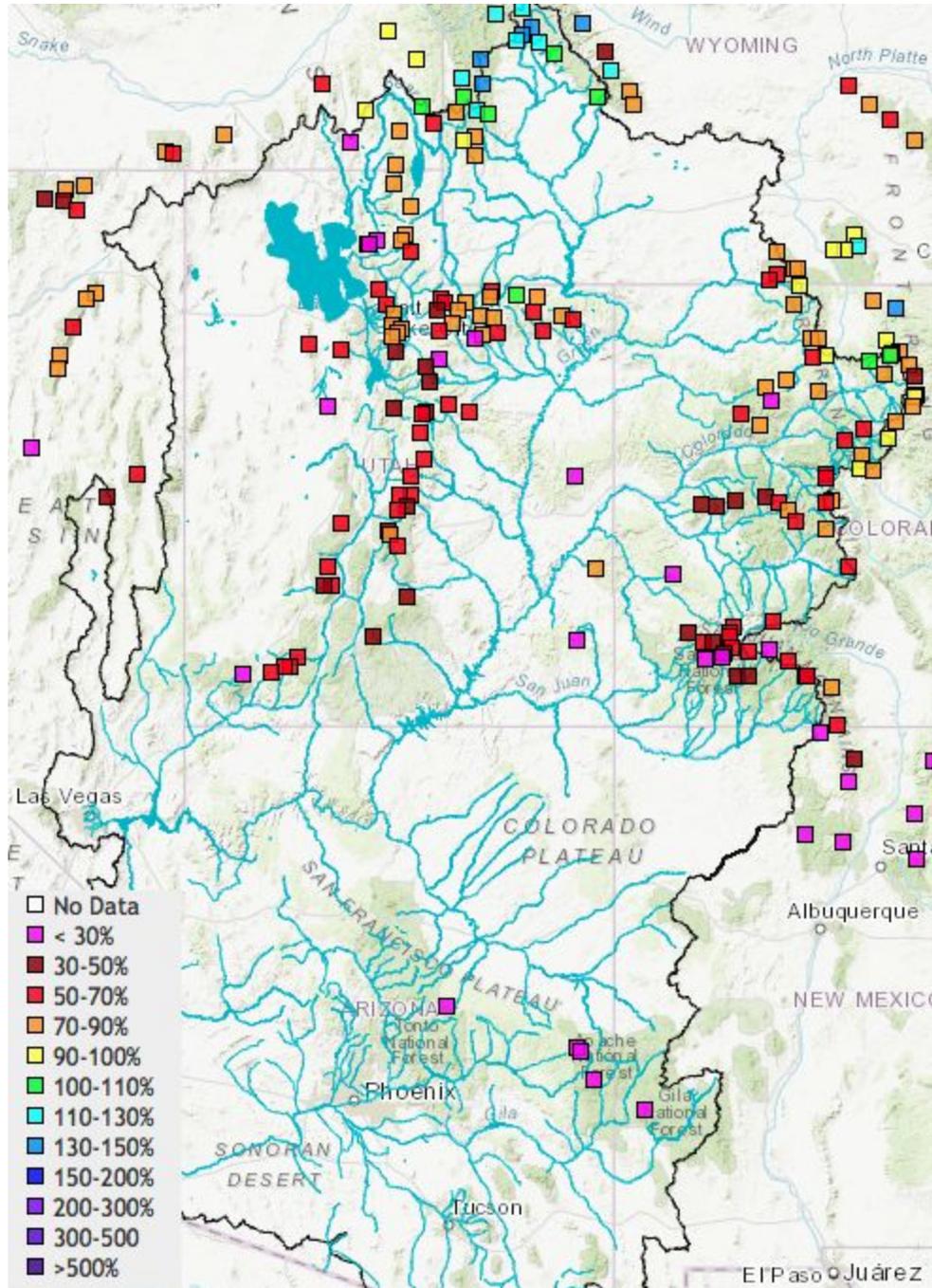
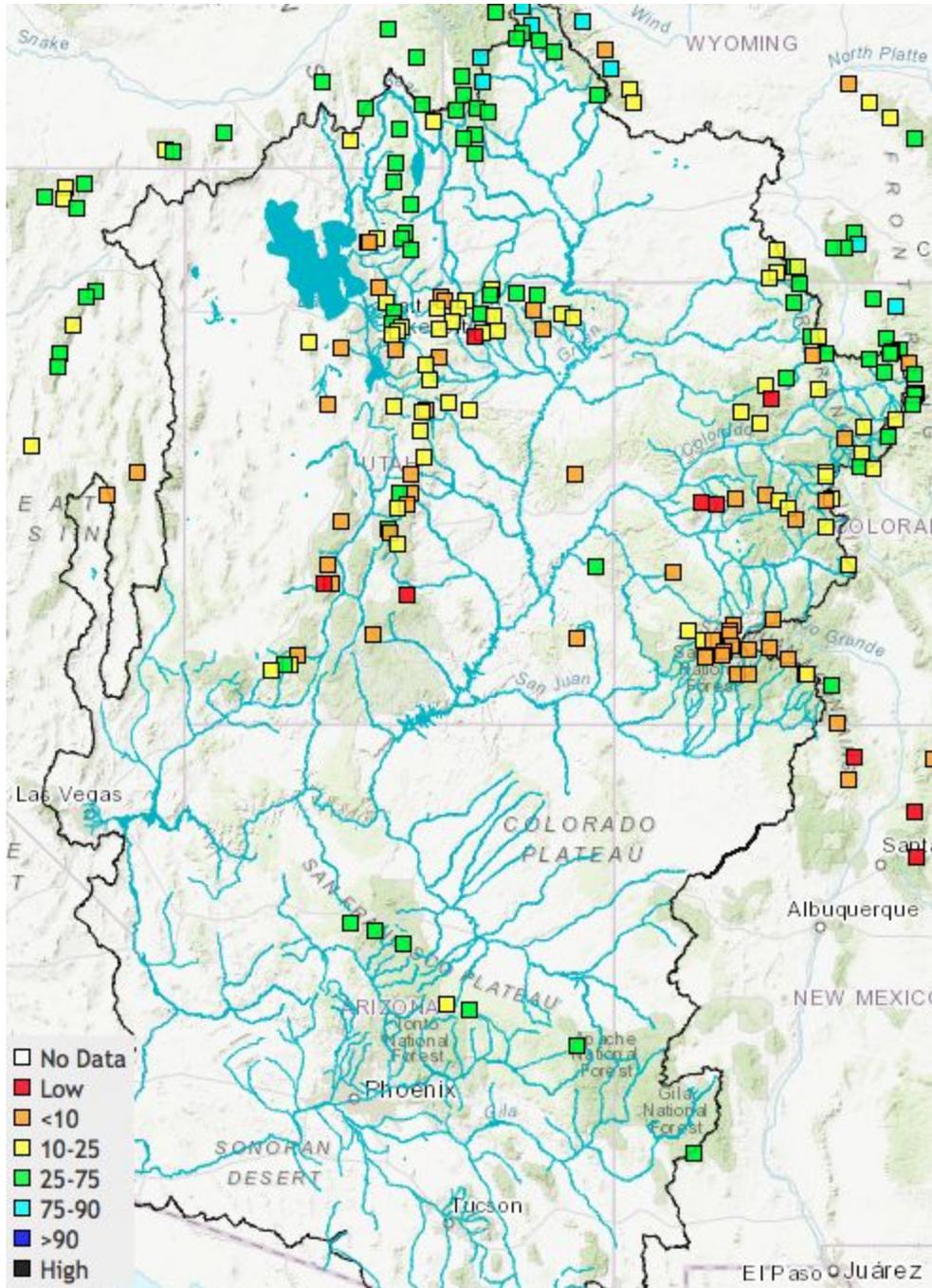


Image: Percent Median Snow Conditions as of April 4th, 2018

The snow percentile image displayed below indicates where the current snow measurement ranks in the historical record (typically 35-40 years) for each site. In previous months there have been many sites depicted with red boxes, indicating the lowest values on record for the time of year. This month there are only a few, but many sites with orange boxes are in the bottom 3 on record for this time of year, while those with yellow boxes rank in the bottom six on record.

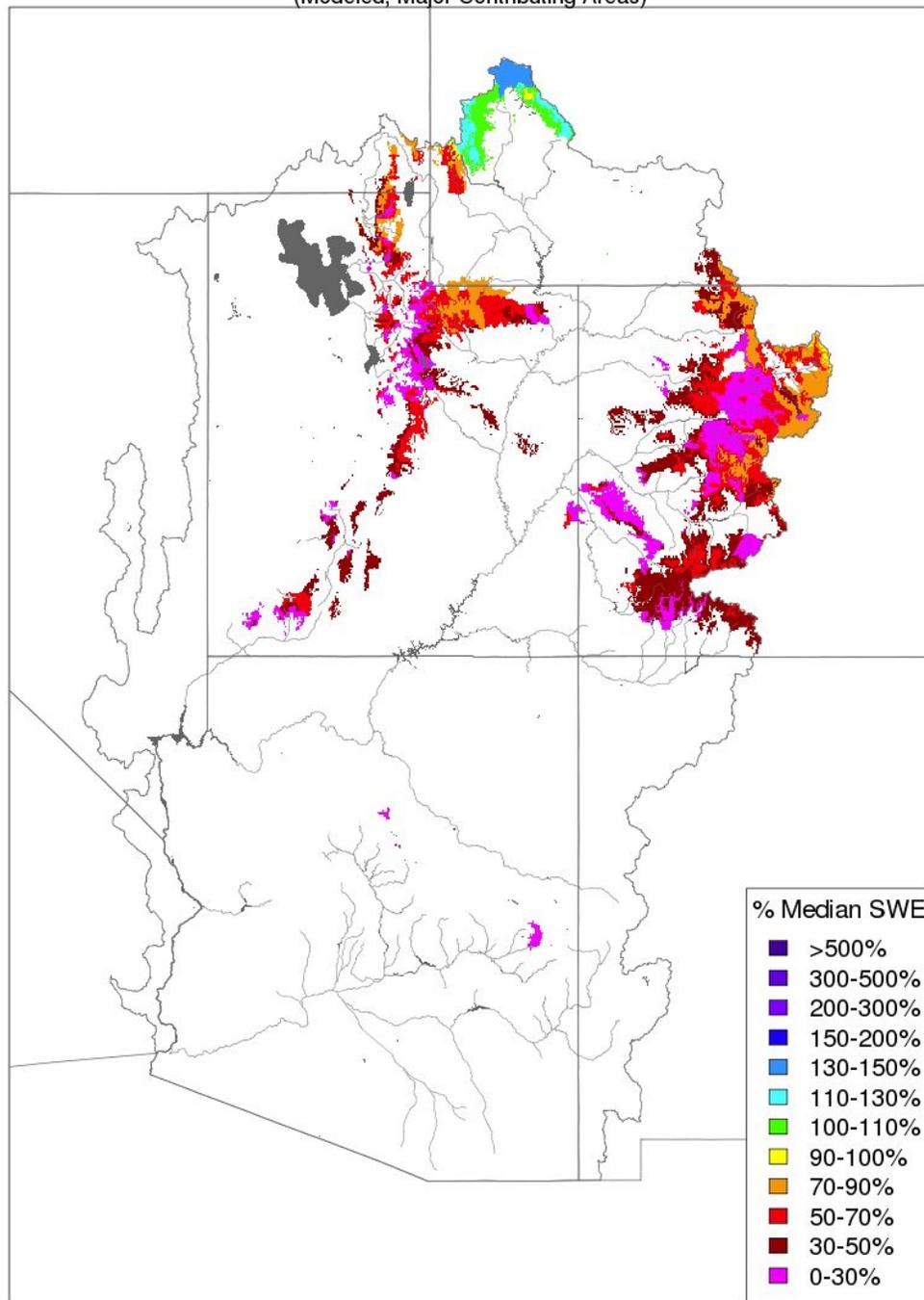


Snow Percentile Image: Historical SNOTEL ranking as of April 4th, 2018

The image below is the representation of snow in the CBRFC hydrologic model. Only those areas that provide the greatest contribution to the April-July runoff volumes are displayed. The snow represented in the model closely mirrors the SNOTEL image. The takeaway message is that poor snowpack conditions are widespread as indicated by the hydrologic model.

## Snow Conditions - April 04 2018

(Modeled, Major Contributing Areas)



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

Modeled Snow: Snow representation from the CBRFC hydrologic model April 4th, 2018

For updated SNOTEL information, click [here](#).

For CBRFC hydrologic model snow conditions, click [here](#)

**Soil Moisture:**

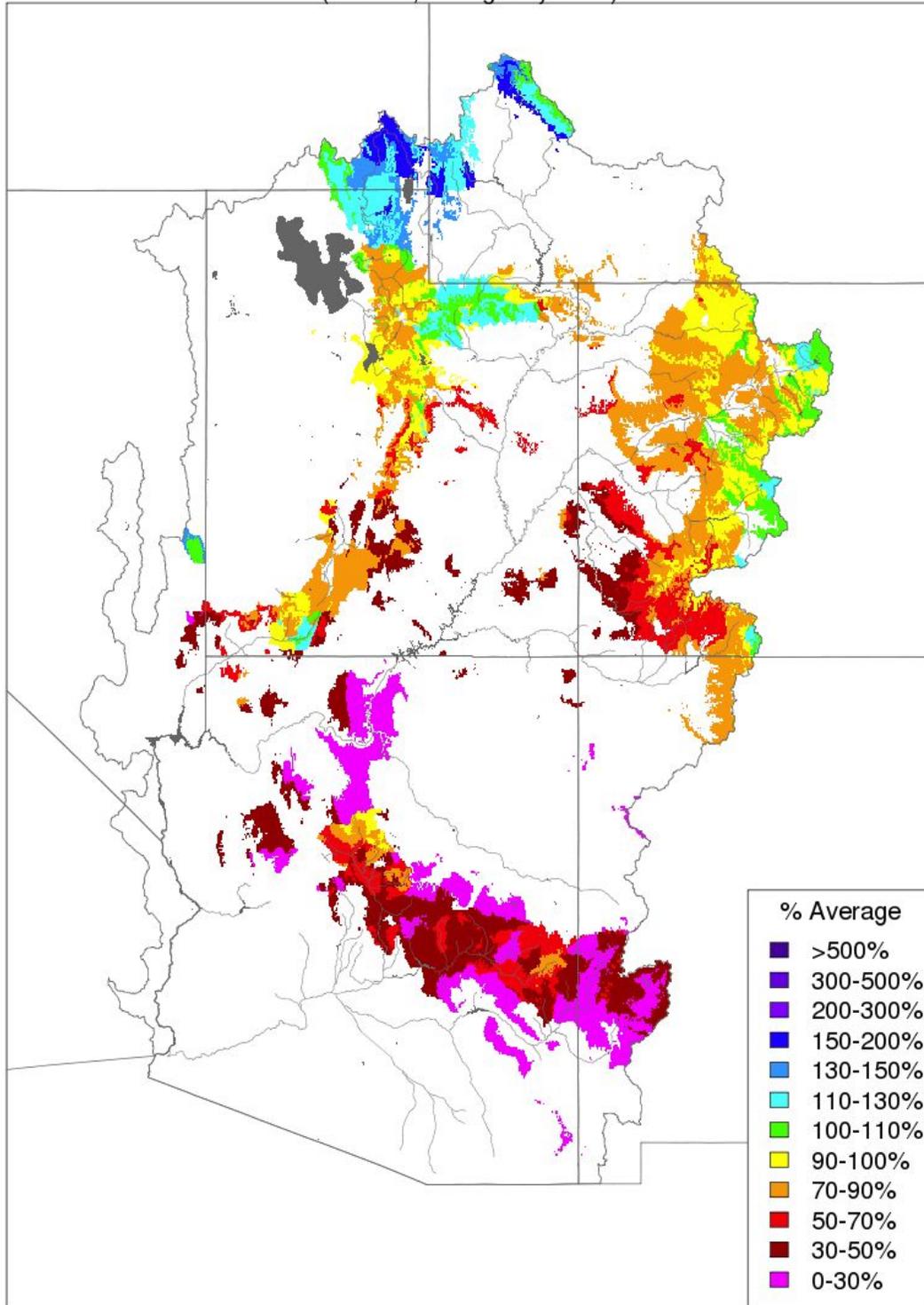
Soil moisture conditions in the higher elevation headwater areas are important entering the winter, prior to snowfall, as it influences the efficiency of the snowmelt runoff the following spring. The effects are most pronounced when soil moisture conditions and snowpack conditions are both much above, or much below average. In areas where the soil moisture was below average entering the winter and the current snowpack is also much below median, spring runoff may be further reduced.

Modeled soil moisture conditions as of November 16th were above average over the Upper Green River Basin and Bear River Basin. Soil moisture conditions were near average in the Duchesne River Basin and the headwaters of the Colorado and Gunnison Rivers as well as the easternmost headwaters of the San Juan River. Elsewhere in both the Great Basin and Upper Colorado River Basin, the modeled soil moisture conditions were below average.

In the map below areas in cool colors (e.g. blue and purple) are above the historical model soil moisture average while those in the warm colors (e.g. red and orange) indicate below average conditions. Only the higher elevations are displayed and the areas in white are not included.

# Soil Moisture - Fall - 2017 (November 16)

(Modeled, Averaged by Basin)



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)

Image: Modeled soil moisture from the CBRFC hydrologic model entering the winter season

Soil moisture conditions tend to fluctuate more in the Lower Colorado River Basin of Arizona and New Mexico in the winter due to the frequency of rain events and possibility of melting snow. Soil conditions in the fall are less informative than they are in the northern basins that remain under snowpack throughout the winter season.

Winter soil moisture conditions continue to be much below average in the Lower Colorado River Basin as shown in the image below. This generally means that it will take a few rain events before any significant runoff is generated.

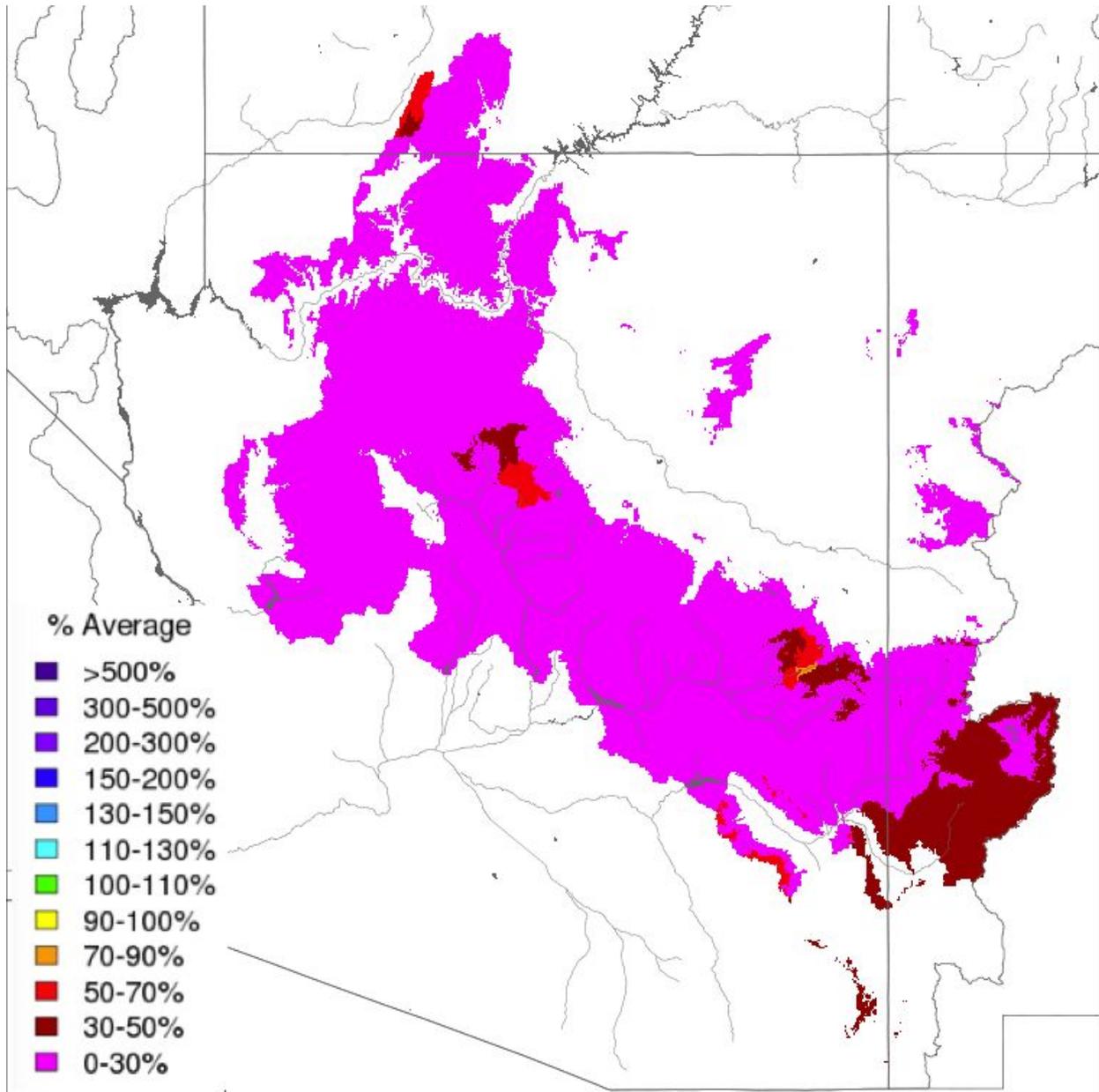


Image: Lower Colorado River Basin (AZ/NM) model soil moisture as of April 4th, 2018

### Upcoming Weather:

A series of storm systems are on the horizon as we enter April. The question is just how far south the precipitation impacts will occur. The first system impacts the area the weekend of April 6-8 with widespread precipitation expected over the upper Colorado River Basin and Great Basin. The storm has a subtropical origin and contains significant moisture. While the greatest precipitation is expected along the western U.S. coast some may carry inland and impact primarily the northern Great Basin and upper Green River Basin. Additional precipitation may occur later during the second week of April as another storm system approaches the area. The zonal atmospheric flow pattern is typical for April and usually results in a series of fast moving storm systems. However at this time the focus of most precipitation appears to be limited to the northern parts of the CBRFC forecast area.

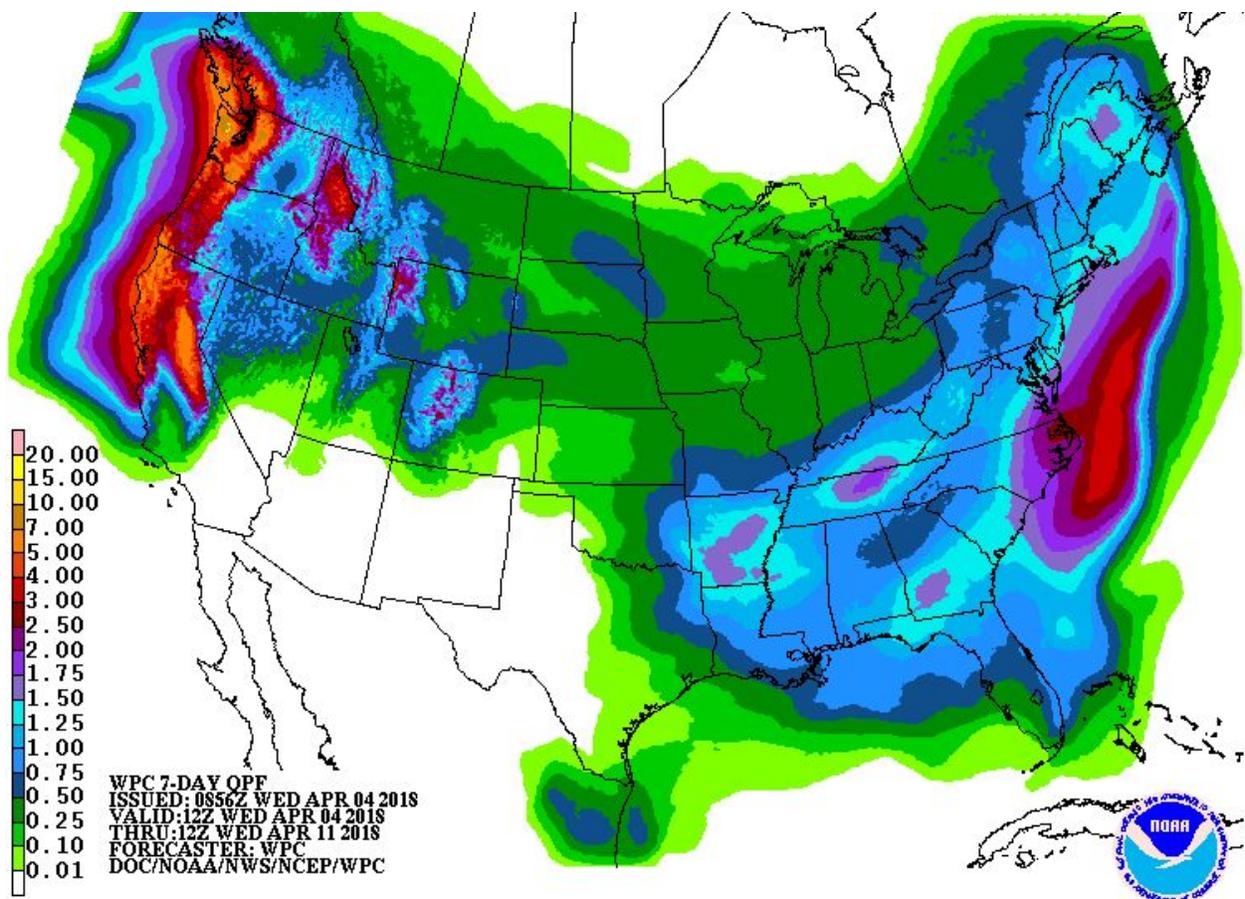


Image: NWS Weather Prediction Center precipitation forecast for Apr 4th - Apr 11th, 2018

**End Of Month Reservoir Content Tables**

[Green River Basin](#)

[Upper Colorado River Basin](#)

[San Juan River Basin](#)

[Great Salt Lake Basin](#)

[Sevier Basin](#)

**Basin Conditions and Summary Graphics**

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[Upper Colorado River Basin](#)

[San Juan River Basin](#)

[Great Salt Lake Basin](#)

[Sevier River Basin](#)

[Virgin River Basin](#)